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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,853	07/15/2003	Karen L. Noel	200308870-1	7585
22879 7590 01/11/2007 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			EXAMINER PANTOLIANO JR, RICHARD	
			ART UNIT	PAPER NUMBER
			2194	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/619,853	NOEL ET AL.	
	Examiner	Art Unit	
	Richard Pantoliano Jr	2194	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

William Thomson
WILLIAM THOMSON
 SUPERVISORY PATENT EXAMINER
 TECHNOLOGY CENTER 2100

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is filed in response to amendments filed for Application# **10/619,853** filed on **13 October 2003**. Amended **Claims 1 & 12** and original **Claims 2-11 and 13-20** are currently pending and have been considered below.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. **Claims 1-5** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. **Claim 1** recites that the virtual address accessed by the first and second functional units are the same, and then goes on to state that the pointers are different. Since the virtual addresses are the pointers to the memory locations, these limitations are contradictory. For the purpose of examination, the Examiner will consider the claim as though the virtual addresses and pointers are the same.
5. **Claims 2-5** depend off of **Claim 1** but do not correct the deficiencies of **Claim 1**. Therefore, **Claims 2-5** are rejected for the same reason as **Claim 1** above.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1, 3, and 12-14** are rejected under 35 U.S.C. 102(e) as being anticipated by McDonald (PG Pub: 2003/0088608).

Claim 1: McDonald discloses the method comprising:

a) determining, by a first program, an attribute of a first functional unit by referencing a virtual memory address, the first functional unit comprising a first processor and a random access memory (RAM) coupled to the first processor in a computer system, and the first program executing in the first functional unit ([0033], [0053] and Figure 5) *(The control blocks contain the identifier of the processor to which it was assigned. Since a Scalable Coherent Interface(SCI) is used to make local memory appear as though it were a part of memory for the entire system, the address used to describe the total system memory is a virtual address that must be converted to a local address);*

b) determining, by a second program, an attribute of a second functional unit by referencing the virtual memory address, the second functional unit comprising a second processor and a RAM coupled to the second processor in the computer system, and the second program executing in the second functional unit; and wherein the referencing the virtual memory address by the first program provides a pointer to an attribute stored

Art Unit: 2194

in the RAM of the first functional unit ([0033], [0053] and Figure 5) (The control blocks contain the identifier of the processor to which it was assigned. Since a Scalable Coherent Interface(SCI) is used to make local memory appear as though it were a part of memory for the entire system, the address used to describe the total system memory is a virtual address that must be converted to a local address. When accessing the same queue at the same virtual memory address, the processors will receive different threads from the queue, each of which will contain status information about the functional unit); and

c) wherein the referencing the virtual memory address by the second program provides a pointer to an attribute stored in the RAM of the second functional unit ([0053] and Figure 5) (The control blocks contain the identifier of the processor to which it was assigned. In accessing this information by the dispatcher, the address of or "pointer" to that control block is stored within a register.).

Claim 3: McDonald discloses the method of **Claim 1**, wherein determining an attribute of the first functional unit further comprises determining a functional unit identification number ([0033], [0053] and Figure 5) (The control blocks contain the identifier of the processor to which it was assigned. Since McDonald cites the use of the Scalable Coherent Interface(SCI) standard in connecting the components, and SCI uses ID numbers to identify the devices being connected, it is inherent that the fields in the control blocks indicate unique processor identification numbers).

Claim 4: McDonald discloses the method of **Claim 1**, wherein determining an attribute of the first functional unit further comprises determining low and high physical address of the RAM of the first functional unit ([0017] and [0036]) *(Threads are dispatched to processors based partially on what is contained in memory attached to the processor. Since the address space of all of the memory units in the system is shared, the low and high address of each of those units must be known to allow for a determination as to which attached processor the thread should be scheduled).*

Claim 12: McDonald discloses a computer readable medium ([0076]) containing an executable program that, when implemented, implements the method comprising:

a) reading a functional unit identifier from a random access memory (RAM) coupled to a program in which the program executes ([0053] and Figure 5) *(The control blocks are stored in memory and contain the identifier of the processor to which it was assigned which constitutes the determining of which functional unit the program is executing); and*

b) addressing data at a same virtual address by different processors in different functional units, wherein each processor in a different functional unit reads different data specific to its functional unit ([0053] and Figure 5) *(The control blocks are stored in memory and contain the identifier of the processor to which it was assigned. When accessing the same queue at the same virtual memory address, the processors will receive different threads from the queue, each of which will contain status information about the functional unit)*

Claim 13: McDonald discloses the computer readable medium of **Claim 12** wherein the executable program further comprises allocating memory from RAM within the functional unit. ([0012] and [0032]) *(The operating system allocates necessary memory in the storage attached to the processor).*

Claim 14: McDonald discloses the computer readable medium of **Claim 12** wherein the executable further comprises scheduling a program to execute on the processor in the functional unit ([0020], [0052] and [0053]) *(The control block contains "ideal processor" information for the thread, which is used in determining to which processor the thread should be sent).*

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over McDonald (PG Pub: 2003/0088608) in view of Boyce (Windows 2000 Quick Fixes O'Reilly Publishing, 2000).

McDonald discloses the system of **Claim 1**, but does not disclose detecting the Input/Output devices attached to the first functional unit. However, McDonald does

Art Unit: 2194

disclose the use of Windows 2000 in NUMA systems. Boyce discloses that the device manager in Windows 2000 can display a hierarchical listing of connections between devices and that said functionality was included in previous versions of the Windows operating system. It would have been obvious to take said functionality of the Windows 2000 device manager and incorporate it into McDonald's to one of ordinary skill in the art because it was a technique that was old and well-known in the art.

10. **Claims 2, 6-11, and 15-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over McDonald (PG Pub: 2003/0088608) in view of Suzuki (US Pat: 6,092,157).

Claim 2: McDonald discloses the method of **Claim 1**, and further discloses replicating a portion of an operating system into a portion of RAM for both functional units ([0043]). McDonald does not disclose the copying of said operating system portion or the attribute information to a read-only portion of RAM.

Suzuki teaches the use of read-only portions of RAM to store program code (*Column 5, Lines 52-62*). Since an operating system is a program, it would have been obvious to one of ordinary skill in the art that said operating system code should be stored in this read-only area. One would have been motivated by the fact that it is old and well-known in the art that program code should be stored in read-only regions of memory to ensure that no intentional or unintentional corruption of the operating system code takes place.

Since the attribute information does not need to be altered in the process of determining to which processor the thread should be sent, the attribute information could also be copied to the read-only area of the RAM. It would have been obvious to one of ordinary skill in the art to so do because it is old and well-known in the art that, by placing the operating system code and the data which that code will analyze directly adjacent to one another in memory, accessing that information would be more efficient than accessing memory not in adjacent locations.

Claims 6 and 15: McDonald discloses a system comprising:

- a) a first means for executing programs coupled to a first means for storing programs and instructions (McDonald, [0033]-[0036] and *Figures 1 and 2*);
- b) a second means for executing programs coupled to a second means for storing programs and instructions (McDonald, [0033]-[0036] and *Figures 1 and 2*); and

Art Unit: 2194

c) copying a portion of the operating system to the first and second storage means (McDonald, [0043]).

McDonald does not disclose the copying of said operating system portion or the attribute information to a read-only portion of either storage means.

Suzuki teaches the use of read-only portions of a storage means (RAM) to store program code (Suzuki, Column 5, Lines 52-62). Since an operating system is a program, it would have been obvious to one of ordinary skill in the art that said operating system code should be stored in this read-only area. One would have been motivated by the fact that it is old and well-known in the art that program code should be stored in read-only regions of memory to ensure that no intentional or unintentional corruption of the operating system code takes place.

Since the attribute information does not need to be altered in the process of determining to which processor the thread should be sent, the attribute information could also be copied to the read-only area of the RAM. It would have been obvious to one of ordinary skill in the art to so do because it is old and well-known in the art that, by placing the operating system code and the data which that code will analyze directly adjacent to one another in memory, accessing that information would be more efficient than accessing memory not in adjacent locations.

Claims 7 and 16: McDonald and Suzuki disclose the systems of **Claim 6** and of **Claim 15**, with McDonald further disclosing the reading of the attributes of the first and second units being accomplished by referencing virtual memory addresses ([0033],

Art Unit: 2194

[0053] and Figure 5) (The control blocks contain the identifier of the processor to which it was assigned. Since a Scalable Coherent Interface(SCI) is used to make local memory appear as though it were a part of memory for the entire system, the address used to describe the total system memory is a virtual address that must be converted to a local address).

Claims 8 and 17: McDonald and Suzuki disclose the systems of **Claim 6** and of **Claim 15**, with McDonald further disclosing:

a) the attribute of the first functional unit being a functional unit identifier (*[0033], [0053] and Figure 5) (The control blocks contain the identifier of the processor to which it was assigned. Since McDonald cites the use of the Scalable Coherent Interface(SCI) standard in connecting the components, and SCI uses ID numbers to identify the devices being connected, it is inherent that the fields in the control blocks indicate unique processor identification numbers); and*

b) wherein the operating system program determines the functional unit within which it is executed by reading the functional unit identifier (*[0033], [0053] and Figure 5) (The control blocks contain the identifier of the processor to which it was assigned and is read by the operating system's dispatcher process).*

Claims 9 and 18: McDonald and Suzuki disclose the systems of **Claim 6** and of **Claim 15**, with McDonald further disclosing the attribute of the first functional unit being a functional unit identifier (*[0033], [0053] and Figure 5) (The control blocks contain the*

Art Unit: 2194

identifier of the processor to which it was assigned. Since McDonald cites the use of the Scalable Coherent Interface(SCI) standard in connecting the components, and SCI uses ID numbers to identify the devices being connected, it is inherent that the fields in the control blocks indicate unique processor identification numbers).

Claims 10 and 19: McDonald and Suzuki disclose the systems of **Claim 9** and of **Claim 18**, with McDonald further disclosing the operating system component using the function unit identifier to determine a local means storing for allocation ([0017], [0020] and [0043]) *(Threads are dispatched to processors based partially on what is contained in memory attached to the processor. A process is assigned an ideal processor to which the operating system tries to schedule that process, then allocates memory for that program in the locally attached storage means until that means is exhausted).*

Claims 11 and 20: McDonald and Suzuki disclose the systems of **Claim 9** and of **Claim 18**, with McDonald further disclosing using the functional unit identifier for scheduling a program stored in a local means for storing([0020], [0052] and [0053]) *(The control block contains "ideal processor" information for the thread, which is used in determining to which processor the thread should be scheduled).*

Response to Arguments

11. Applicant's arguments filed **13 October 2006** have been fully considered but they are not persuasive.

12. As per **Claim 1**, Applicant argues that the cited passages from McDonald do not teach accessing of a virtual address by two functional units resulting in pointers that point to an attribute of each of the functional units. However, Examiner contends that McDonald does show this by way of the threads dispatched to the functional units by accessing the globally accessible ready queue disclosed by McDonald. When both a first and a second functional unit access the virtual address at which the ready queue is stored, each functional unit receives a thread to process. By accessing the control blocks of those threads, the functional units read information pertaining to itself, since those threads are now a part of that functional unit. Therefore, the Examiner maintains the rejection of **Claim 1**.

13. As per **Claim 12**, since Applicant's arguments for the rejection of **Claim 12** were the same as the arguments for **Claim 1**, Examiner maintains the rejection of **Claim 12** for the same reasoning as **Claim 1** above.

14. As per **Claims 6 and 15**, Applicant contends that McDonald does not show portions of the operating system being replicated among the functional units. However, Applicant fails to take into account the fact that, since the operating system consists of instructions to be executed and which *are stored* among the functional units. All programs, at some point execute operating system to perform a function (memory allocation, performing input/output, controlling a piece of hardware, etc.). When a thread makes such a request on Windows 2000 (the operating system utilized in McDonald's disclosure), the operating system will execute that request in a kernel

Art Unit: 2194

thread in place of that executing thread on that particular functional unit. Since the system as disclosed by McDonald is designed to cause memory to be allocated within the system to be distributed according to what thread is executing in a functional unit, the fact that the threads will be executing on the functional units will cause memory associated with the operating system to be moved to said units. For that reason, the Examiner maintains the rejections of **Claims 6 and 15**.

15. Since arguments for all other claims were based on the rejections of the above claims, the rejection of all claims of this application are rejected for the reasoning above.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

17. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2194


the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Pantoliano Jr whose telephone number is (571) 270-1049. The examiner can normally be reached on Monday-Thursday, 8am - 4 pm EST.

19. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Thomson can be reached on (571)272-3718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RP
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